

## Amendments To Claims

Claims 1-10. (Cancelled).

11. (New) A method for adapting a Bayesian network that models an environment, comprising:

obtaining a set of present observation data from the environment;

updating a set of parameters of the Bayesian network in response to the present observation data using a learning rate that indicates a relative weight of the present observation data and a set of past observation data pertaining to the environment.

12. (New) The method of claim 11, wherein updating comprises updating the parameters using a different learning rate for each parameter of the Bayesian network.

13. (New) The method of claim 11, further comprising determining the learning rate by determining an initial value for the learning rate and determining an estimate of the parameters in response to the present observation data and increasing the learning rate if an error between the estimate and a mean value of the parameters is relatively large.

14. (New) The method of claim 11, further comprising determining the learning rate by determining an initial value for the learning rate and determining an estimate of the parameters in response to the present observation data and decreasing the learning rate when convergence is reached between the estimate and a mean value of the parameters.

15. (New) The method of claim 11, wherein a subset of values in the present observation data is unavailable when updating.

16. (New) The method of claim 11, wherein the environment is an online environment.

17. (New) The method of claim 16, wherein the online environment is an email system.

18. (New) The method of claim 16, wherein the online environment is an e-commerce system.

19. (New) The method of claim 16, wherein the online environment is a database system.

20. (New) The method of claim 11, wherein updating comprises determining an initial set of the parameters and then updating the parameters in response to the present observation data using the learning rate.

21. (New) A system, comprising:

on-line environment that generates a set of present observation data;

Bayesian network that performs automated reasoning for the on-line environment in response to the present observation data;

on-line adapter that obtains the present observation data from the on-line environment and that adapts a set of parameters for the Bayesian network in response to the present observation data according to a learning rate that indicates a relative weight of a set of past observation data and the present observation data.

22. (New) The system of claim 21, wherein the on-line adapter adapts the parameters using a different learning rate for each parameter of the Bayesian network.

23. (New) The system of claim 21, wherein the on-line adapter

adapts the parameters by determining an initial set of the parameters and then updating the parameters in response to the present observation data using the learning rate.

24. (New) The system of claim 21, wherein the on-line adapter determines the learning rate by determining an initial value for the learning rate and determining an estimate of the parameters in response to the present observation data and increasing the learning rate if an error between the estimate and a mean value of the parameters is relatively large.

25. (New) The system of claim 21, wherein the on-line adapter determines the learning rate by determining an initial value for the learning rate and determining an estimate of the parameters in response to the present observation data and decreasing the learning rate when convergence is reached between the estimate and a mean value of the parameters.

26. (New) The system of claim 21, wherein a subset of values in the present observation data is unavailable.

27. (New) The system of claim 21, wherein the online environment is an email system.

28. (New) The system of claim 21, wherein the online environment is an e-commerce system.

29. (New) The system of claim 21, wherein the online environment is a database system.